

NON-VOLATILE SEMICONDUCTOR MEMORY DEVICES AND METHODS FOR MANUFACTURING THE SAME

Inventor: Kenji YAMADA

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This application is a Divisional of U.S. Application Serial No. 10/091,551, filed March 7, 2002, ^{now U.S. Patent No. 6,667,814} which is hereby incorporated by reference in its entirety. Applicant hereby incorporates by reference Japanese Application No. 2001-063103, filed March 7, 2001, in its entirety.

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Technical Field

The present invention relates to non-volatile semiconductor memory devices, and includes non-volatile semiconductor memory devices in which three kinds of data can be written and read at one memory cell unit.

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Related Art

Non-volatile semiconductor memory devices have certain desired characteristics, for example, they are better suited for development towards greater capacity than DRAMs and SRAMs, and are also capable of high-speed access.

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In particular, in recent years, non-volatile semiconductor memory devices whose memory capacity can be readily expanded and in which digitized image data and voice data can be more efficiently written and read are required.

Summary

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Embodiments relate to a non-volatile semiconductor memory device including a semiconductor substrate and an impurity region and an element isolation region formed in the semiconductor substrate. The device also includes first and second memory elements mutually isolated by the element isolation region. The impurity region includes a first impurity diffusion layer and a second impurity diffusion layer. The first and second